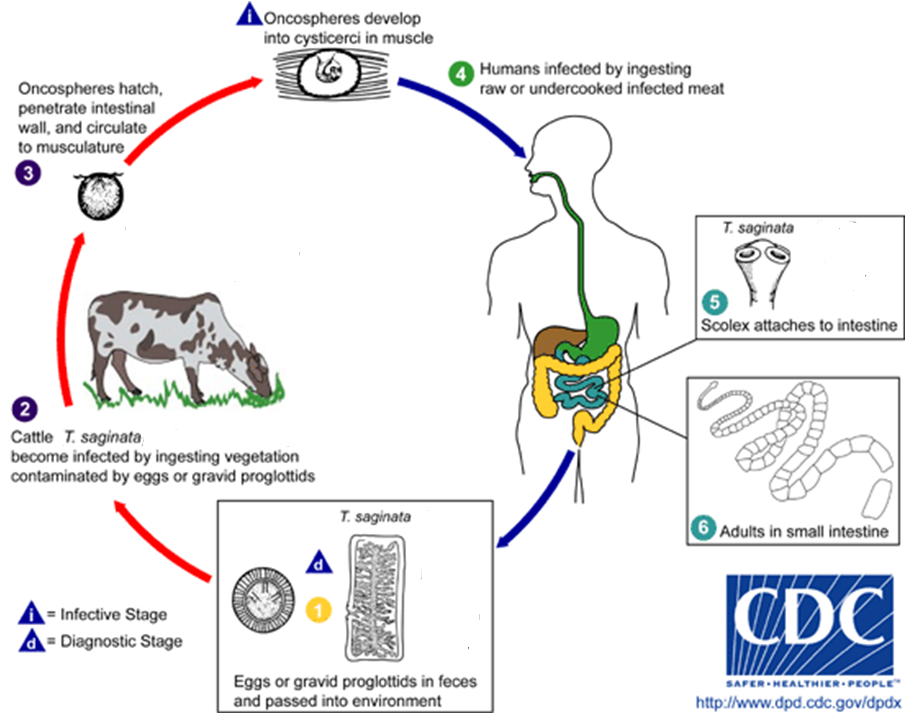
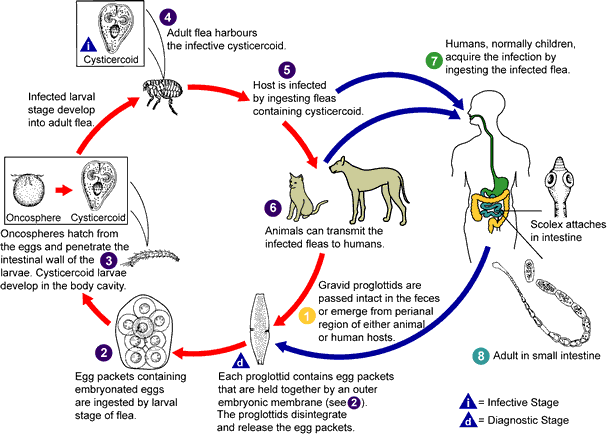
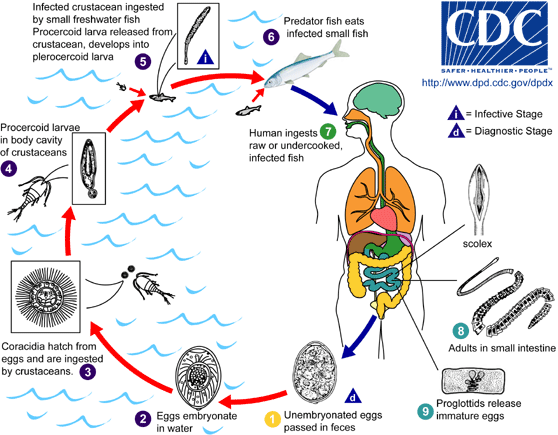
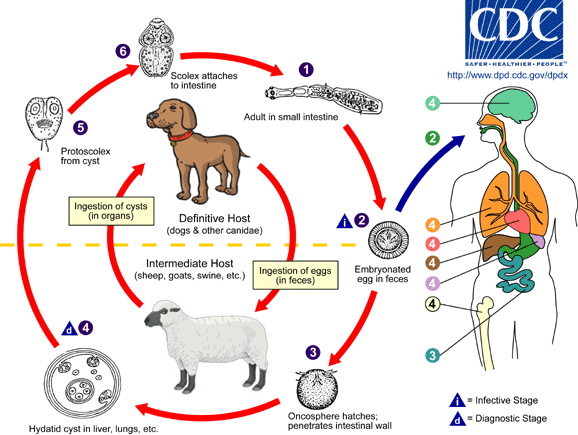
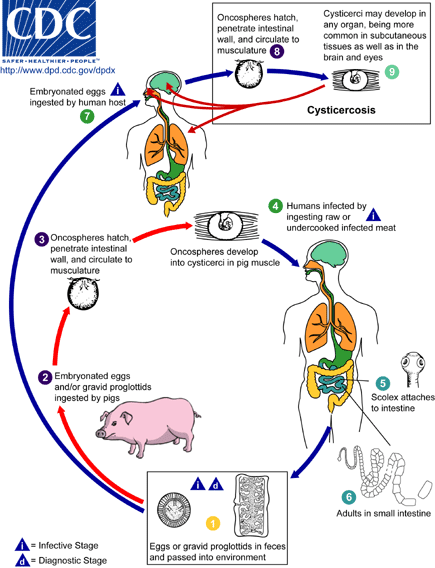
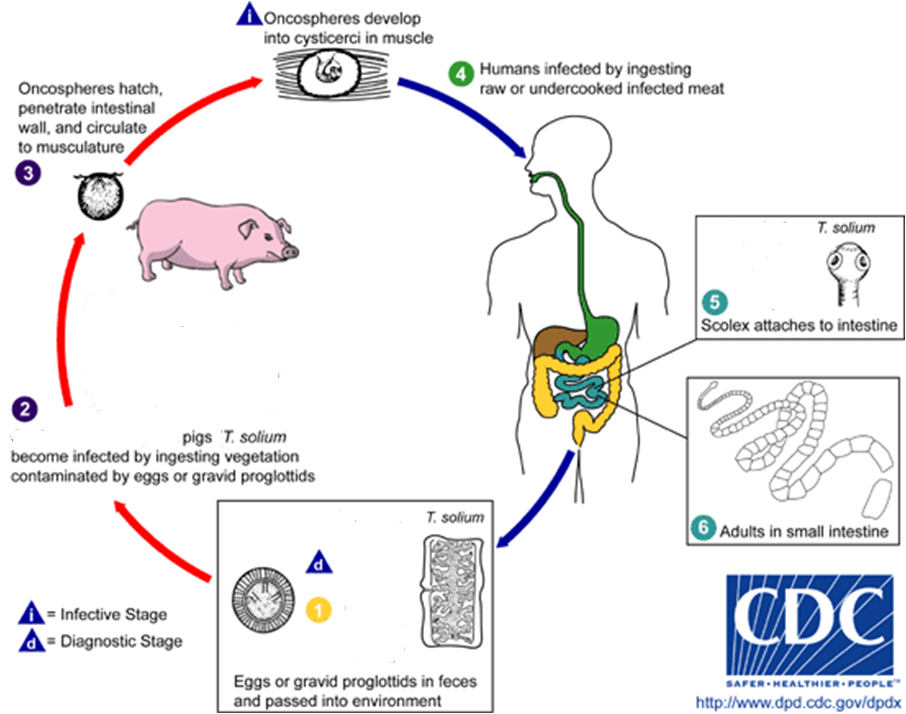
**Diphyllobothrium latum *Dipylidium caninum* Life cycle *Taenia saginata***

**(Fish Tapeworm) Lifecycle** **(Beef tapeworm) Lifecycle**



***Taenia solium* (PORK tapeworm) *Taenia solium* (PORK tapeworm) *Echinococcus granulosus* (Hydatid worm)**

**(Cysticercosis)**



|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| ANTIHELMINTHS | | | | |
| DRUG | INDICATIONS | MECHANISM OF ACTION | ADVERSE EFFECTS | SPECIAL NOTES |
| Ivermectin | -Drug of Choice for Strongyloidiasis and onchocerciasis  -Also active vs. intestinal nematodes | -opens Cl- sensitive channels associated with GABA transmission  -causes paralysis of peripheral muscles  -in onchocerciasis it is microfilaricidal (but does not kill adult worms) | -Infrequent, mostly host response to dying microfilariae  -N/V/D, pruritis, rash, edema, joint/muscle pain, etc. | -avoid other drugs that alter GABA activity during treatment (i.e. barbiturates) |
| Malathion | -Head lice and nits | -organophosphate insecticide |  | -note that organophosphates cause cholinergic overdose symptoms if abused/accidentally overdosed |
| Permethrin | -Pediculus humanus, pthirus pubis and Sarcoptes scabiei | -synthetic insecticide acting on parasites nervous cell membranes | - transient burning, pruritis and stinging at application site |  |
| Lindane | -Scabies  -also used as an insecticide  -recommended as a second line agent due to toxicities | -organochlorine compound | -seizures, CNS toxicity and aplastic anemia have been reported | -Available in shampoo and lotion formulations |
| Praziquantel | -Schistosome infections  -most trematodes (flukes) and cestodes (tapeworms) including cysticercosis | **-increase calcium permeability of trematode and cestode cell membranes**  -results in net loss causing worm paralysis, dislodgement and eventual death | -common and transient  -N/V/D, pruritus, lethargy and fever | -schistosome **symptoms may initially become exacerbated** probably due to proteins released from the dying worms |
| Diethylcarbamzine | -Drug of choice for filariasis, loiasis, and tropical eosinophilia | -**immobilizes microfilariae**, alters surface structures and **displaces** them from tissue  -increases phagocytosis as a result of displacement  -mode of action against adults is unknown | -generally mild and transient  -malaise, anorexia, weakness, N/V/D, etc  Later:  -lymphangitis and local swelling with W. bancrofti or B. malayi infections as parasites die | -caution in use w/ hypertension or renal disease |
| Pyrantel pamoate | -broad spectrum  -alternative to mebendazole for Ascaris, hookworm or pinworm | -neuromuscular junction actions- increase Ach release and inhibit cholinesterases (**net increase in Ach signaling**) | -infrequent, transient, mild  -N/V headache and rash |  |
| Niclosamide | -**Second line** drug vs. tapeworms (after Praziquantel) | -rapid killing of worms by **inhibition of oxidative phosphorylation** | -Infrequent and transitory  -N/V | -Avoid EtOH |
| Benzimidazoles | **-Broad spectrum vs. helmithes**  -Intestinal nematodes:  Ascaris lumbricoides, Necator americanus (Hookworm), Strongyloides, Trichinella spiralis, Enterobius vermicularis (pinworms), Trichuris (whipworm), all cutaneous/visceral larval stages  -Adjunct therapy for Echinococcus  -Albendazole for taenia solium | -**bind beta tubulin and inhibit microtubule synthesis**  -also larvicidal in hydatid disease, cysticercosis, ascariasis and hookworm infections | -mild epigastric pain, N/V/D  -long term albendazole is well tolerated but can induce elevated transaminases, pancytopenia, alopecia, fevers, & fatigue |  |